Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria® palpable abdominal mass.

BIBLIOGRAPHIC SOURCE(S)

Gay SB, Bree RL, Rosen MP, Foley WD, Grant TH, Heiken JP, Huprich JE, Lalani T, Miller FH, Sudakoff GS, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® palpable abdominal mass. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 3 p. [12 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Gay SB, Bree RL, Foley WD, Glick SN, Heiken JP, Huprich JE, Levine MS, Ros PR, Rosen MP, Shuman WP, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. Palpable abdominal mass. [online publication]. Reston (VA): American College of Radiology (ACR); 2006. 3 p. [7 references]

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Palpable abdominal mass

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Critical Care
Emergency Medicine
Family Practice
Gastroenterology
Internal Medicine
Radiology
Surgery

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of radiologic procedures in the diagnosis and evaluation of patients with a palpable abdominal mass

TARGET POPULATION

Patients with a palpable abdominal mass

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation

1. Computed tomography (CT), abdomen, with or without contrast
2. Ultrasound (US), abdomen
3. Magnetic resonance imaging (MRI), abdomen, with or without contrast
4. X-ray
    - Abdomen
    - Contrast enema
    - Upper gastrointestinal (GI) series
    - Upper GI series with small bowel follow-through

MAJOR OUTCOMES CONSIDERED

- Utility of radiologic examinations in differential diagnosis
- Cost

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the

participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by the Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

Investigators have stressed the ability of computed tomography (CT) and ultrasound to image masses no matter what their organ of origin and have touted them as first-line procedures for evaluation of palpable masses. While certain combinations of clinical findings could lend themselves to a more targeted approach (for example, hematemesis plus a palpable gastric-region mass might merit endoscopy as the first study), cross-sectional imaging in general is well suited to initial evaluation of abdominal masses. One study in 1981 showed that, compared with strategies not using CT, the use of CT can result in savings in time for diagnosis and overall cost of hospitalization.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Palpable Abdominal Mass

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen with or without contrast	8	Most definitive	Med
US abdomen	7	Less costly and no ionizing radiation	None
MRI abdomen with or without contrast	6	No ionizing radiation. See comments regarding contrast in the text below under "Anticipated Exceptions."	None
X-ray abdomen	5	A simple and inexpensive way to evaluate bowel for obstruction or constipation as cause of the "mass."	Med
X-ray contrast enema	4		Med
X-ray upper GI series	4		Med
X-ray upper GI series with small bowel follow-through	4		Med
Rating Scale: 1=Least appropriate, 9=Most appropriate			***Relative Radiation Level**

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Little has been written about the generic use of imaging in evaluating palpable abdominal masses since the 1980s. Rather, newer reviews and case reports have focused on evaluation of specific masses using computed tomography (CT), ultrasound (US), and magnetic resonance imaging (MRI).

Investigators have found both US and CT excellent for affirming or excluding a clinically suspected abdominal mass, with sensitivity and specificity values in excess of 95%. This is particularly noteworthy since as few as 16% to 38% of patients referred for suspected abdominal mass will have that diagnosis corroborated by an imaging study. So, in most cases, the "mass" initially palpated does not actually exist.

Both US and CT can visualize the organ from which a mass arises. The success of US in determining organ of origin has been 88% to 91%, while CT has fared somewhat better at 93%. US is limited by bowel gas in cases of dilated bowel or by body habitus in some obese individuals. As one might expect, attempts to predict the pathologic diagnosis of masses based on imaging findings are less

successful. US studies correctly predicted the pathologic diagnosis in 77% to 81% of cases, while CT suggested the diagnosis in 88% of cases.

Investigators have stressed the ability of CT and US to image masses no matter what their organ of origin and have touted them as first-line procedures for evaluation of palpable masses. While certain combinations of clinical findings could lend themselves to a more targeted approach (for example, hematemesis plus a palpable gastric-region mass might merit endoscopy as the first study), cross-sectional imaging in general is well suited to initial evaluation of abdominal masses. Plain radiographs may also be considered as a first step. If the patient reports constipation, a plain radiograph could confirm or exclude that diagnosis or diagnose bowel obstruction or colonic volvulus, for example, without the need for CT. One study in 1981 showed that, compared with strategies not using CT, the use of CT can result in savings in time for diagnosis and overall cost of hospitalization.

At the time of this writing, no comparative studies evaluating MRI versus CT or US are available. One recent report of a rare abdominal wall tumor did demonstrate the excellent multiplanar capabilities of MRI. In the absence of data, the usefulness of MRI in evaluating palpable masses is unknown. It is likely comparable to CT and US.

Anticipated Exceptions

Nephrogenic systemic fibrosis (NSF, also known as nephrogenic fibrosing dermopathy) was first identified in 1997 and has recently generated substantial concern among radiologists, referring doctors and lay people. Until the last few years, gadolinium-based MR contrast agents were widely believed to be almost universally well tolerated, extremely safe and non-nephrotoxic, even when used in patients with impaired renal function. All available experience suggests that these agents remain generally very safe, but recently some patients with renal failure who have been exposed to gadolinium contrast agents (the percentage is unclear) have developed NSF, a syndrome that can be fatal. Further studies are necessary to determine what the exact relationships are between gadolinium-containing contrast agents, their specific components and stoichiometry, patient renal function and NSF. Current theory links the development of NSF to the administration of relatively high doses (e.g., >0.2mM/kg) and to agents in which the gadolinium is least strongly chelated. The U.S. Food and Drug Administration (FDA) has recently issued a "black box" warning concerning these contrast agents (http://www.fda.gov/cder/drug/InfoSheets/HCP/gcca_200705HCP.pdf).

This warning recommends that, until further information is available, gadolinium contrast agents should not be administered to patients with either acute or significant chronic kidney disease (estimated glomerular filtration rate [GFR] <30 mL/min/1.73m^2), recent liver or kidney transplant or hepato-renal syndrome, unless a risk-benefit assessment suggests that the benefit of administration in the particular patient clearly outweighs the potential risk(s).

Abbreviations

- CT, computed tomography
- GI, gastrointestinal

- MRI, magnetic resonance imaging
- US, ultrasound

Relative Radiation Level	Effective Dose Estimated Range
None	0
Minimal	<0.1 mSv
Low	0.1-1 mSv
Medium	1-10 mSv
High	10-100 mSv

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Selection of appropriate radiologic imaging procedures for evaluation and diagnosis of patients with a palpable abdominal mass

POTENTIAL HARMS

Recently some patients with renal failure who have been exposed to gadolinium contrast agents (the percentage is unclear) have developed nephrogenic systemic fibrosis (NSF), a syndrome that can be fatal. The U.S. Food and Drug Administration (FDA) has recently issued a "black box" warning concerning these contrast agents. This warning recommends that, until further information is available, gadolinium contrast agents should not be administered to patients with either acute or significant chronic kidney disease (estimated glomerular filtration rate [GFR] <30 mL/min/1.73m^2), recent liver or kidney transplant or hepato-renal syndrome, unless a risk-benefit assessment suggests that the benefit of administration in the particular patient clearly outweighs the potential risk(s).

Relative Radiation Level (RRL)

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Additional information regarding radiation dose assessment for imaging examinations can be found in the American College of Radiology (ACR) Appropriateness Criteria® Radiation Dose Assessment Introduction document (see "Availability of Companion Documents" field).

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1998 (revised 2008)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Gastrointestinal Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Spencer B. Gay, MD; Robert L. Bree, MD, MHSA; Max Paul Rosen, MD, MPH; W. Dennis Foley, MD; Thomas H. Grant, DO; Jay P. Heiken, MD; James E. Huprich, MD; Tasneem Lalani, MD; Frank H. Miller, MD; Gary S. Sudakoff, MD; Frederick L. Greene, MD; Don C. Rockey, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® *Anytime*, *Anywhere*™ (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.
- ACR Appropriateness Criteria® radiation dose assessment introduction. American College of Radiology. 2 p. Electronic copies: Available from the American College of Radiology Web site.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on March 19, 2001. The information was verified by the guideline developer on March 29, 2001. This summary was updated by ECRI on July 31, 2002. The updated information was verified by the

guideline developer on October 1, 2002. The summary was updated on August 11, 2006. The summary was updated by ECRI Institute on June 23, 2009.

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